

# THE MINERAL INDUSTRY OF THE UNITED KINGDOM

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Mine production of ferrous and nonferrous metals in the United Kingdom has been declining since around 1970 because of depleting reserves. Metal processing, however, remained the basis of a large and economically important mineral industry, and imports were required to satisfy metallurgical requirements.

The industrial minerals sector provided a significant base for expanding the extractive industries, and the balance shifted away from the metallic mineral sector. Companies had a substantial interest in the production of industrial minerals, such as aggregates, ball clay, china clay (kaolin), and gypsum (table 1).

The United Kingdom, which was a leading trading and financial center, was the world's fourth largest economy after the United States, Japan, and Germany. Government initiatives included continued privatization, deregulation, support for competition, and containment of the growth of social welfare programs (Alexander's Gas & Oil Connections, 2003§<sup>1</sup>).

The gross domestic product (GDP) in 2002 was \$1.6 trillion based on purchasing power parity; per capita GDP based on purchasing power parity was \$26,235. The unemployment rate was 5.2%. The growth rate was estimated to be 1.8% (International Monetary Fund, 2004§).

## Government Policies and Programs

In 2002, the statute that governed the development and working of mineral deposits was called the 1971 Act. This act consolidates all earlier planning legislation and has been amended by various statutes. Minerals are defined in section 209 of the 1971 Act to include all minerals and materials in or under land of a kind ordinarily worked for removal by underground or surface workings; it does not, however, include peat cut for purposes other than for sale. Mineral development is specifically addressed in the Town and Country Planning (Minerals) Regulations, 1971 and the Town and Country Planning (Minerals) Act, 1981. Mineral rights to mineral fuels, such as coal, petroleum, and uranium, belong to the State. The Coal Authority is authorized to license open pit and underground mines to the private sector subject to restrictions on their size and the payment of a royalty on the amount of coal produced.

Most other mineral rights in Great Britain are privately owned. The exceptions are gold and silver, the rights to which are vested in the Royal Family and are referred to as "Crown Rights." A different situation regarding mineral rights applies to Northern Ireland where, under the Mineral Development Act (Northern Ireland), 1969, the rights to work minerals and to license others to do so are vested in the State.

The United Kingdom is a member of the European Union (EU), but has not committed to adopting the euro (€), which is the single European currency. The Government has stated that a decision on whether to do so would be made on the basis of strict economic self-interest and only if approved by the electorate in a public referendum. An assessment of the national economy is underway to determine whether there is sustainable convergence and sufficient flexibility within the economies of the €zone to make joining feasible. The results of this assessment are not expected before mid-2003 at the earliest (Alexander's Gas & Oil Connections, 2003§).

## Environmental Issues

Environmental conditions in the United Kingdom have improved in recent years. Much of the environmental legislation derives from the EU. The EU's 6th Environmental Action Programme 2002 sets the framework for EU policy on the environment for the next 10 years.

Although some pollutants, such as nitrogen oxides, have not decreased substantially, sulfur dioxide emissions have. Reductions in carbon emissions and other pollutants, such as sulfur dioxide, have resulted primarily from deregulation and privatization of the electricity industry. Privatization of the electricity industry in 1990 led to a reduction in coal subsidies, thus narrowing the price difference between coal and natural gas. As consumers switch to natural gas, the benefits of burning this cleaner fuel are being realized. Under the negotiated Kyoto Protocol (signed on April 29, 1998, but not ratified), the United Kingdom agreed to reduce greenhouse gases to 8% below 1990 levels by the 2008-12 commitment period (U.S. Energy Information Agency, 2003b§).

The End of Life Vehicles (ELV) Directive (2000/53/EC) aims to reduce the amount of waste from ELVs. In particular, it restricts the use of certain heavy metals in new vehicles produced after July 1, 2003; introduces a "certificate of destruction" for scrapped vehicles; requires producers to mark certain vehicle components to aid recycling and to make available dismantling information with respect to new vehicles; states that producers must provide free takeback for a vehicle put on the market after July 1, 2002, if such a vehicle has a negative value when scrapped; and requires that ELVs be treated (scrapped) only by authorized treatment facilities, which must meet environmental standards (Department of Trade and Industry, 2002§).

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<sup>1</sup> References that include a section mark (§) are found in the Internet References Cited section.

## Production

The Department of Trade and Industry (DTI) ensured a continuing supply of minerals for the country's industry and oversaw mineral activities. Its areas of responsibility were all nonfuel minerals, which included all metallic ores and such industrial minerals as barite, china clay (kaolin), fluorspar, high-grade limestone, potash, salt, and silica sand. The industrial minerals sector also included aggregates, brick and brick clay, cement and its raw materials, dimension stone, gypsum for plaster, and sand and gravel used in the construction industry.

The DTI was also responsible for mineral fuels, which included coal, natural gas, and petroleum, and for issuing licenses for the exploration, appraisal, and production of natural gas and petroleum. Primary energy production accounted for 10% of the GDP.

State and privately owned corporations produced minerals and mineral-based products. State ownership was significantly reduced in the mineral industry; state ownership was retained mainly in the nuclear industry (table 2).

## Trade

The United Kingdom was the world's fourth largest economy and was a trading nation with a generally free and open market. The country had surplus trade balances in chemicals, metal articles, and mineral products. Also, there was a surplus on investment income, which has increased substantially in the past 5 years. The country ran a surplus on trade in services, which made up 23% of total exports. In 2001 (the latest year for which data were available), total exports were \$286 billion, and total imports were \$330 billion (U.S. Central Intelligence Agency, 2002§).

## Commodity Review

### *Metals*

**Aluminum.**—Alcan Inc. shut down its Burntisland, Scotland, alumina plant on November 30, 2002, because the company was unable to find a buyer for the facility. This closure spelled Alcan's withdrawal from the specialty chemicals market in Europe. The 100,000-metric-ton-per-year (t/yr) plant was the country's only Bayer alumina line and produced a range of alpha, calcined, milled, and reactive alumina and specialty alumina trihydrate (Mining Journal, 2002a).

Of the four primary aluminum smelters in the United Kingdom, three were owned and operated by British Alcan Aluminium Ltd. (the subsidiary of Alcan Aluminium Ltd. of Canada). The fourth smelter, which was operated by Anglesey Aluminium Ltd., was owned by Rio Tinto Ltd. (51%) and Kaiser Aluminum and Chemical Corp. of the United States (49%). All the aluminum smelters depended on imported alumina for feedstock.

The French-based aluminum producer Pechiny Group signed an agreement in principle to buy the aluminum-processing business of steel producer Corus plc of the United Kingdom. Corus announced its intent to dispose of its aluminum business as a noncore asset. The assets to be acquired comprised plants in Bitterfeld, Bonn, Koblenz, and Vogt in Germany, Duffel in Belgium, and 60% interests in Cap de la Madeleine in Canada and Tianjin in China. Corus would own primary smelters in Germany and Holland (Mining Journal, 2002f).

Secondary aluminum refining in the United Kingdom was not typical of the rest of Western Europe in that the country had fewer very large companies and a greater number of smaller ones. Thus, of about 150 Western European refiners in 2001, 30 were in the United Kingdom. In 2000, the United Kingdom had 54 refiners of which about one-half had capacities of less than 4,000 t/yr. No refiners in the United Kingdom had a capacity of more than 50,000 t/yr, whereas Germany had five such refineries; Italy, four; and France, two (Metal Bulletin Monthly, 2002).

**Ferroalloys.**—Eastlink Ferroalloys Ltd. was planning to start ferrovanadium alloy production in 2002 at a rate of from 1,000 to 2,000 t/yr at its plant in Glossop. The project would be the first phase of production. The company's ferromolybdenum production was expected to continue to range from 4,000 t/yr to 4,500 t/yr; this was down from its previous production of 7,000 t/yr (Metal Bulletin, 2002a).

**Gold.**—The Bank of England (BoE) concluded its final auction of 20 metric tons (t) of gold on behalf of the Royal Treasury. The BoE reported that the gold sold for \$296.50 per troy ounce and was almost four times oversubscribed. The price secured by the BoE was the highest of the previous auctions. The Treasury previously sold 395 t of gold in its 3-year program (Mining Magazine, 2002).

Conroy Diamonds and Gold plc reported the discovery of a third area of bedrock gold mineralization in the Armagh-Monaghan Gold Belt, which is located in Tivnacree in County Armagh, Northern Ireland, 1.2 kilometers (km) southwest of the company's Cargalisgorran deposit. Tullybuck-Lisglassen in County Monaghan, Ireland, is located 5 km to the southwest of Tivnacree. All three areas lie along the same geologic trend. Preliminary trenching exposed similar structures and lithologies to those hosting gold at other localities in the Gold Belt. Trench sampling at Tivnacree returned a best value of 1.62 grams per metric ton (g/t) gold over a 5-km area; this value was comparable to the initial results from trenching at Cargalisgorran (Mbendi, 2002a§).

Tournigan Ventures Corp. entered into an agreement with European Gold Resources plc to acquire 75% in the Omagh gold project in County Tyrone, Northern Ireland. The Omagh project was a large exploration concession located 5 km southwest of the town of Omagh and covered an area of 189 square kilometers (km<sup>2</sup>). Previous exploration work by Rio Tinto plc identified 15 mineralized

structures in the eastern one-third of the concession. One such structure, which is known as the Kearney structure, was defined by trenching and 41 diamond drill holes. On the basis of this work, it was estimated to have a potential resource of 9,300 kilograms of gold with an average grade of 7 g/t gold (MBendi, 2002b§).

**Iron and Steel.**—The Corus Group, which was created in 1999 by the merger of British Steel plc. of the United Kingdom and Koninklijke Hoogovens NV of the Netherlands and was the fifth largest steel producer in the world, announced that it cancelled its proposed \$4.3 billion merger with Companhia Siderurgica Nacional (CSN) of Brazil; CSN was Brazil's largest steel producer. The Group cited the volatility of the Brazilian reais (BRL) and uncertainty about market risk among its lenders as the principal factors. Also, the recovery in demand for steel products was slower than anticipated (Mining Journal, 2002c).

The steel scrap industry was feeling the effect of the collapse of ASW Holdings plc, which had been the United Kingdom's second largest steel producer after the Group. Although AWS remained in limited production, scrap buyers were feeling the pinch as liability premiums rose (by fivefold in some cases) and scrap suppliers looked to tighten their credit lines. AWS was estimated to consume about 600,000 t/yr of locally generated scrap, which was largely made from shredded and bailed material. One possible outlet for the excess shredded material that was expected to accumulate was thought to be France, which has a shortage of old cast and light iron scrap (Metal Bulletin, 2002b).

**Tin.**—The only tin mining activity was the marginal production of cassiterite by a tourist operation in Cornwall. The ore was smelted onsite to produce metallic tin for jewelry and ornaments.

A feasibility study funded by the European Social Fund Objective One and undertaken by the Camborne School of Mines and the Clean River Trust concluded that the Wheal Jane Mine in Cornwall could be developed as a site of international excellence for research into the treatment of metal-contaminated mine waters and other waste water and techniques for contaminated land. The former mine became the site of a passive treatment project after a large amount of metal-contaminated acid mine water escaped from the flooded operation into nearby rivers (Mining Journal, 2002i).

**Zinc.**—MIM Holdings Ltd. announced in 2001 that it would sell its zinc smelters at Avonmouth, United Kingdom, and Duisberg, Germany, following poor performances during the 12 months prior to June 30, 2001. The company reached an agreement to sell the Duisberg refinery to Sudamin Investment GmbH. The Avonmouth smelter, however, was to be closed at a cost of \$45 million<sup>2</sup> (Mining Journal, 2002b).

Britannia Refined Metals Ltd. (MIM's subsidiary) put a proposal to its employees and their trade unions for the closure of the Northfleet No. 2 lead refinery. This proposal followed the announced closure of the Avonmouth lead-zinc smelter, which supplied the No. 2 refinery with crude lead (Mining Journal, 2002).

### *Industrial Minerals*

**Clays.**—The United Kingdom was a leading world producer and exporter of ball clay and china clay (kaolin). Watts, Blake, Bearne & Co. plc (WBB) was the country's largest producer of ball clay. Imerys Group was the largest producer of china clay in the United Kingdom and a major producer worldwide. Operations were mainly in the southwestern area of the United Kingdom.

**Diamond.**—The Kimberly Process, which was named after the first meeting organized by the South African Government in 2000 in the town of the same name, was set up to devise an international certification method for the trade in rough diamond. The main objectives are to end the illegal trade in conflict diamond and to protect the legitimate industry; conflict diamond are diamonds that have been exploited illegally and sold to fund armed conflict in such places as Angola, the Democratic Republic of the Congo, and Sierra Leone. The United Kingdom, which was a major diamond trading country, was actively involved in the negotiations that set up this process.

The Kimberly Process can be summarized as follows: Each consignment of rough (which includes industrial-quality) diamond to be exported or imported into participating countries in the Kimberly Process has to be accompanied by a duly attested Kimberly Process certificate supplied by the exporting Government. If destined for somewhere outside the EU, then a shipment will not be imported to or be exported from the United Kingdom unless it has such a certificate. Exports from the United Kingdom to another Member State of the EU does not require such a certificate. Each consignment will have a tamper-proof box duly sealed by Government authorities before a certificate can be issued and export authorized. Each company trading in rough diamond will be obliged to ensure that it purchases rough diamond only from legitimate sources. Each company trading in rough diamond must have an external auditor review the warranty for each purchase and must include a copy of these findings, along with a copy of a warranty for each sale, in the company's annual audit report (Mining Journal, 2002h).

The consumer market for diamond in the United Kingdom was expected to surpass \$1.5 billion in 2002. The first quarter of 2002 showed a 13% year-on-year increase. This prompted reports that the country had the fastest growing consumer market for diamond. The increase was attributed primarily to low interest rates, high consumer confidence, and a rise in the average age of people getting married (Rapaport News, 2002§). The United Kingdom's trade in diamond is listed in tables 3 and 4.

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<sup>2</sup> Where necessary, values have been converted from United Kingdom pounds (£) to U.S. dollars (\$) at the rate of £1.00=US\$1.57.

**Gypsum.**—British Gypsum Ltd. (a subsidiary of BPB Industries plc.) was the major producer of gypsum in the United Kingdom. The company had mines in Cumbria, Leicestershire, Nottinghamshire, Staffordshire, and Sussex that produced about 1.5 million metric tons per year (Mt/yr) of gypsum. With few exceptions, this material went to supply the domestic market.

**Potash.**—Cleveland Potash Ltd. (CPL), which was the only potash producer in the United Kingdom, operated the Boulby Mine in Yorkshire. CPL also mined rock salt as a coproduct from an underlying seam in the Boulby Mine. The seam of potash extends out under the North Sea and occurs at depths of between 1,200 and 1,500 meters (m) in a seam that ranged up to 20 m but averaged 7 m in thickness.

CPL announced the completion of its sale to Israel Chemicals fertilizer division, ICL Fertilizers. The process of integrating CPL into ICL was underway. Following the acquisition, the worldwide capacity of ICL reached 5 Mt, which made it one of the five largest potash producers in the world. ICL Fertilizers products worldwide included potash, phosphate rock, phosphoric acid, and superphosphates (Cleveland Potash Ltd., 2002§).

**Sand and Gravel and Crushed Stone.**—A levy of \$3.35 per metric ton on new aggregate quarried in the United Kingdom was introduced on April 1, 2002. It applied to sand, gravel, and crushed rock subject to commercial exploitation, which included aggregates dredged from the seabed within territorial waters. To protect international competitiveness, the tax was also levied on imports, but not on exports. The objective of the levy was to address the environmental costs associated with quarrying (noise, dust, visual impact, and loss of amenity) in line with the Government's statement of intent on environmental taxation, to reduce the demand for virgin aggregate, and to encourage the use of recycled materials. Recycled and secondary aggregates were not subject to the tax (British Geological Survey, 2002§).

### ***Mineral Fuels***

**Coal.**—Coal provided about 39% of the country's raw energy needs. This equated to 54 Mt/yr of coal, which made coal the largest fuel source used for power generation. Coal production declined steadily during the past 10 years (Mbendi, 2002c§).

The European Commission (EC) gave approval to the Government to give \$14 million in state aid to 10 coal mines that posted operating losses. The money was intended to improve the economic viability of the mines by reducing production costs (Mining Journal, 2003).

Most of the coal mining industry was owned by UK Coal plc (formerly RJB Mining plc), which was the largest coal mining company in the United Kingdom and the largest independent coal producer in the EU. UK Coal announced that production at its Selby Mine complex would be phased out in March 2004 owing to difficult mining conditions and continuing financial losses. The three mines (Riccall, Stillingfleet, and Wistow) had operating losses of more than \$50 million in 2001. The Selby site covers 285 km<sup>2</sup> and was developed in the 1980s at a cost of about \$2 billion. There were originally five operating mines and, at peak production in the mid-1990s, production was about 12 Mt/yr. About one-quarter of UK Coal's work force (2,100 jobs) will be lost (Mining Journal, 2002g).

The last underground coal mine in Scotland, the Longannet Mine, was forced to close owing to the effects of a catastrophic flood of 78 million liters of water. The cost of recovering the mine was estimated to be more than \$70 million, and no guarantee could be given that a similar flood would not occur again. The closure of the mine will leave about 30 Mt of low-sulfur coal remaining in the Kincardine deposit (Mining Journal, 2002d).

**Natural Gas and Petroleum.**—The North Sea holds Europe's largest natural gas and petroleum reserves and was one of the world's key producing regions not in the Organization of the Petroleum Exporting Countries. A major part of the United Kingdom's estimated 5-billion-barrel petroleum reserves is located in the North Sea. Most of the country's production comes from basins east of Scotland in the central North Sea. The northern North Sea (east of the Shetland Islands) also contains considerable reserves, and smaller deposits are located west of the Shetland Islands in the North Atlantic Ocean. More than 100 natural gas and petroleum fields were onstream in 2002, and several hundred companies were active in the area. In 2002, production of petroleum declined to an estimated 2.53 million barrels per day (Mbbbl/d); this was down from the historical high of 2.95 Mbbbl/d in 1999. Production was expected to decline further in 2003. Natural gas maintained its production volume at the 2001 level; it was, however, expected to start to decline in 5 years as the larger fields are depleted (U.S. Energy Information Agency, 2003a§).

The Royal Dutch/Shell Group bought Enterprise Oil plc in a \$6.1 billion transaction that significantly increased Shell's holdings in the North Sea. Shell increased its United Kingdom North Sea production by 30% and its Norwegian North Sea production by 50%. The EU gave its approval of the takeover and stated that it would not violate EU antitrust rules (Oil and Gas International, 2002§).

Exploration for petroleum on the Falkland Islands Continental Shelf was governed by Falkland Islands law. Although the provisions were independent of the United Kingdom laws and regulations, there were many similarities to the United Kingdom North Sea regime.

The Falkland authorities were seeking to entice major petroleum companies back to the South Atlantic, particularly the North Falkland Basin, to prospect for petroleum. They hoped that high crude prices and rising tension in the Middle East would encourage companies to look somewhere else in case Gulf crude shipments were jeopardized. Test wells drilled in 1998 by Amerada Hess Corp. and Royal Dutch/Shell produced traces of petroleum, but nothing commercial (Alexander's Gas & Oil Connections, 2002b§).

**Renewable Energy.**—The Government was accelerating the development of wind energy. Large areas of shallow sea around the country were earmarked for the expansion of wind power, theoretically enough to provide power for the whole country three times over. The country had more than five times the potential offshore wind resources of any other European country. The Government removed the existing limit on offshore wind farms, which placed the maximum number of turbines at 30. Much larger wind farms will be encouraged. Developers were looking at wind farms of 150 turbines in the Thames estuary. One of the problems that stopped onland wind power from becoming a big player in the energy market was the objections by the countryside lobby. Offshore, this would not be a problem because the turbines would be out of sight (Alexander's Gas & Oil Connections, 2002a§)

AMEC Engineering Group and the Corus Group received planning permission from Redcar Community and the Cleveland Borough Council to develop the country's largest wind farm in the North East. The 18-turbine wind farm Tees Wind North will be designed and developed by AMEC and the Group on the latter's 911-hectare steel-manufacturing site near Redcar in Teesside. Tees Wind North will supply enough electricity to meet the needs of 30,000 households. The project should provide three times the existing installed wind capacity in the region, which will contribute significantly to regional and national targets for wind-generated power (Corus Group, 2002§).

One of the world's first tidal generators was being installed off the coast of Scotland. The prototype tidal generator was being fitted as part of the research to test new forms of renewable energy. The 180-t underwater generator will be located off the Yell Sound area. The project, which was named Stingray, would help the Government meet promises on the environment. Tidal energy was seen as having advantages over hydroelectric energy or wind farms because generators have little environmental impact, are largely invisible above the waterline, and produce no sound (Alexander's Gas & Oil Connections, 2002c§).

## Outlook

The United Kingdom will continue to be a significant player in the world mining and mineral processing industries. This is more the result of an extensive range of companies in the country that have various interests in the international mineral industry rather than the domestic mineral industry.

Exploration for natural gas and petroleum is expected to continue onshore and offshore. Onshore exploration activities will be directed mainly toward gold. Interest in offshore natural gas and petroleum exploration will continue to be focused on North Sea areas, particularly in the areas west of the Shetland Islands, the central North Sea, and the Southern Gas Basin of the North Sea.

The DTI is expected to continue to be involved in the development of mineral resources. Efforts to raise the level of environmental management and to maximize the best use of natural resources, which will include use of recycled materials and renewable energy sources, will continue to be evaluated and developed.

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## Major Sources of Information

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TABLE 1  
UNITED KINGDOM: PRODUCTION OF MINERAL COMMODITIES <sup>1</sup>

(Metric tons unless otherwise specified)

Commodity	1998	1999	2000	2001	2002 <sup>e</sup>
<b>METALS</b>					
Aluminum:					
Alumina from imported bauxite <sup>e</sup>	96,000	90,000	88,500	83,900 <sup>r, 2</sup>	73,800 <sup>2</sup>
Metal:					
Primary	258,397	272,211	305,100	340,778 <sup>r</sup>	344,318 <sup>2</sup>
Secondary	236,000 <sup>e</sup>	274,800	285,300	248,600 <sup>r</sup>	204,900 <sup>2</sup>
Total	494,397	547,011	590,400	589,378	549,218 <sup>2</sup>
Cadmium, metal including secondary	440 <sup>e</sup>	547	503	425 <sup>r</sup>	292 <sup>2</sup>
Copper, metal, refined:					
Primary	7,000	--	--	--	--
Secondary	47,774	50,334	3,000	--	--
Total	54,774	50,334	3,000	--	--
Iron and steel:					
Iron ore and concentrate, manganiferous: <sup>e</sup>					
Gross weight	1,188	1,000 <sup>e</sup>	1,033	510	464 <sup>2</sup>
Fe content (54% Fe)	642	568 <sup>e</sup>	540	281 <sup>r</sup>	255 <sup>2</sup>
Metal:					
Pig iron thousand tons	12,569	12,399	10,989	9,861	8,579 <sup>2</sup>
Steel:					
Crude do.	17,007	16,634	15,306 <sup>r</sup>	13,610	11,718 <sup>2</sup>
Hot-rolled do.	15,214	14,334	13,173 <sup>r</sup>	11,369	10,000
Lead:					
Mine output, Pb content <sup>e</sup>	1,800	1,000	1,000	800 <sup>r</sup>	700
Metal:					
Smelter:					
Bullion from imported concentrate	37,927	40,177	36,700	36,000 <sup>r</sup>	36,000
Secondary, refined <sup>e, 3</sup>	100,000	100,000	100,000	100,000	100,000
Total	137,927	140,177	136,700	136,000 <sup>r</sup>	136,000
Refined:					
Primary <sup>4</sup>	186,212	185,422	166,411	202,915 <sup>r</sup>	207,719 <sup>2</sup>
Secondary <sup>3</sup>	163,492	162,651	170,740	163,390 <sup>r</sup>	166,927 <sup>2</sup>
Total	349,704	348,073	337,151	366,305 <sup>r</sup>	374,646 <sup>2</sup>
Nickel, metal, refined <sup>5</sup>	41,994	39,467	37,976	33,817	33,790 <sup>2</sup>
Tin, mine output, Sn content	400	--	--	--	--
Zinc, metal, smelter	99,600	132,800	99,600	100,000	99,600 <sup>2</sup>
<b>INDUSTRIAL MINERALS</b>					
Barite <sup>e, 6</sup>	68,000	59,000	55,000	66,000 <sup>e</sup>	59,000
Bromine <sup>e</sup>	35,900 <sup>2</sup>	55,000	50,000	50,000	3,500
Cement, hydraulic thousand tons	12,409	13,027 <sup>r</sup>	12,702	11,854	12,000
Clays: <sup>e</sup>					
Fire clay do.	500	575	595	600	500
Fuller's earth <sup>7</sup> do.	95	75	66	52	44 <sup>2</sup>
Kaolin, china clay <sup>8</sup> do.	2,392 <sup>2</sup>	2,304 <sup>2</sup>	2,420 <sup>2</sup>	2,204 <sup>r, 2</sup>	2,163 <sup>2</sup>
Ball clay and pottery clay <sup>7</sup> do.	960	985	1,000	998 <sup>r</sup>	921 <sup>2</sup>
Other, including shale do.	10,000	12,500	12,000	10,100 <sup>r</sup>	10,500
Feldspar, china stone	3,278	3,000 <sup>e</sup>	2,000 <sup>e</sup>	2,995 <sup>r</sup>	3,000
Fluorspar, all grades <sup>e, 9</sup>	65,000	40,000	36,000	50,000	53,000
Gypsum and anhydrite <sup>e</sup> thousand tons	2,000	1,800	1,500	1,600 <sup>r</sup>	1,700
Lime, hydrated and quicklime <sup>e</sup> do.	2,500	2,500	2,500	2,500	2,000
Nitrogen, N content of ammonia do.	871	901	814	850	837 <sup>2</sup>
Potash, K <sub>2</sub> O equivalent	608,400	494,700	600,000	531,900 <sup>r</sup>	540,100 <sup>2</sup>
Salt: <sup>e</sup>					
Rock thousand tons	700	1,500	1,700	1,900	1,900
From brine do.	1,300	1,300	1,200	1,200	1,200
In brine, sold or used as such do.	3,500	3,000	3,000	3,000	3,000
Sand and gravel:					
Common sand and gravel do.	98,315	100,953 <sup>r</sup>	101,621	101,397 <sup>r</sup>	97,000
Industrial sand do.	4,662	4,092 <sup>r</sup>	4,095	4,100 <sup>e</sup>	4,000

See footnotes at end of table.

TABLE 1--Continued  
UNITED KINGDOM: PRODUCTION OF MINERAL COMMODITIES <sup>1</sup>

(Metric tons unless otherwise specified)

Commodity		1998	1999	2000	2001	2002 <sup>e</sup>
INDUSTRIAL MINERALS--Continued:						
Sodium compounds, n.e.s., carbonate <sup>c</sup>	thousand tons	1,000	1,000	1,000	1,000	1,000
Stone:						
Crushed:						
Calcite <sup>c</sup>	do.	15	10 <sup>r</sup>	12 <sup>r</sup>	12 <sup>r</sup>	10
Chalk <sup>c</sup>	do.	9,934 <sup>2</sup>	10,000	10,000	10,000	8,000
Dolomite	do.	15,622	13,698	14,000 <sup>e</sup>	14,000 <sup>e</sup>	12,000
Igneous rock	do.	45,807	53,155	54,113	53,190	50,000
Limestone	do.	88,979	86,933	86,000 <sup>e</sup>	86,000 <sup>e</sup>	99,000
Sandstone	do.	20,129	15,485	15,000 <sup>e</sup>	19,967 <sup>r</sup>	19,000
Slate including fill	do.	450	425	350 <sup>e</sup>	467 <sup>r</sup>	500
Total	do.	180,936	179,706 <sup>r</sup>	179,000 <sup>r, e</sup>	184,000 <sup>r, e</sup>	189,000
Dimension: <sup>c</sup>						
Igneous	do.	138	140	125	497 <sup>r, 2</sup>	500
Limestone	do.	225	295	300	250	250
Sandstone	do.	287	290	300	250	250
Slate	do.	69	70	70	84 <sup>r, 2</sup>	80
Total	do.	719	795	795	1,080	1,080
Sulfur, byproduct: <sup>c</sup>						
Of metallurgy		40,500	61,000 <sup>2</sup>	51,400 <sup>2</sup>	62,400 <sup>r, 2</sup>	66,400 <sup>2</sup>
Of petroleum refining		184,000	136,000	140,000	111,000 <sup>r</sup>	125,000
Total		225,000	197,000	191,000	173,000 <sup>r</sup>	191,000
Talc, soapstone, pyrophyllite <sup>c</sup>		4,937 <sup>2</sup>	5,000	5,000	4,937 <sup>r, 2</sup>	5,000
Titania <sup>e, 10</sup>		200	200	200	200	200
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Anthracite		1,000 <sup>e</sup>	1,000 <sup>e</sup>	797	616	600
Bituminous including slurries, fines, etc.		40,272	36,450	31,175	31,512	28,000
Lignite		1	--	--	--	--
Total		41,300 <sup>e</sup>	37,500 <sup>e</sup>	31,972	32,128	28,600
Coke:						
Metallurgical		6,178	5,837	6,058	5,306 <sup>r</sup>	4,268 <sup>2</sup>
Breeze, all types		370 <sup>r</sup>	330 <sup>r</sup>	370 <sup>r</sup>	210 <sup>r</sup>	221 <sup>2</sup>
Fuel briquets, all grades		616 <sup>e</sup>	635	537	550	431 <sup>2</sup>
Gas, natural:						
Marketable <sup>11</sup>	million cubic meters	95,503	104,900	95,854 <sup>r</sup>	96,000 <sup>e</sup>	96,000
Marketed <sup>e, 12</sup>	do.	68,000	70,000	70,000	70,000	70,000
Natural gas liquids <sup>13</sup>	thousand 42-gallon barrels	58,877	61,859	62,000 <sup>e</sup>	62,000 <sup>e</sup>	62,000
Peat <sup>c</sup>	cubic meters	1,076 <sup>2</sup>	1,000	1,000	1,000	1,000
Petroleum:						
Crude <sup>14</sup>	thousand 42-gallon barrels	931,665	961,965	884,115	821,220 <sup>r</sup>	805,500 <sup>2</sup>
Refinery products:						
Liquefied petroleum gas	do.	25,265	24,406	25,000 <sup>e</sup>	25,000 <sup>e</sup>	25,000
Naphtha including white spirit	do.	21,148	21,675	22,000 <sup>e</sup>	22,000 <sup>e</sup>	22,000
Gasoline	do.	240,210	232,832	230,000 <sup>e</sup>	230,000 <sup>e</sup>	230,000
Jet fuel	do.	63,536	59,032	60,000 <sup>e</sup>	60,000 <sup>e</sup>	60,000
Kerosene	do.	26,900	27,714	28,000 <sup>e</sup>	28,000 <sup>e</sup>	28,000
Distillate fuel oil	do.	207,828	195,280	195,000 <sup>e</sup>	195,000 <sup>e</sup>	195,000
Residual fuel oil	do.	74,000	68,591	68,000 <sup>e</sup>	68,000 <sup>e</sup>	68,000
Lubricants	do.	7,938	6,440	6,500 <sup>e</sup>	6,500 <sup>e</sup>	6,500
Bitumen	do.	13,271	10,102	10,000 <sup>e</sup>	10,000 <sup>e</sup>	10,000
Petroleum coke <sup>e</sup>	do.	5,500 <sup>2</sup>	5,000	5,000	5,000	5,000
Petroleum wax	do.	350	472	400 <sup>e</sup>	400 <sup>e</sup>	400
Unspecified <sup>e</sup>	do.	30,000	30,000	30,000	30,000	30,000
Refinery fuel and losses <sup>e</sup>	do.	25,000	25,000	25,000	25,000	25,000
Total <sup>c</sup>	do.	741,000	707,000	705,000	705,000	705,000

<sup>e</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. <sup>r</sup>Revised. -- Zero.

<sup>1</sup>Table includes data available through May 2003.

<sup>2</sup>Reported figure.



TABLE 1--Continued  
UNITED KINGDOM: PRODUCTION OF MINERAL COMMODITIES <sup>1</sup>

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<sup>3</sup>Includes a small quantity of primary lead from domestic concentrate.

<sup>4</sup>Produced entirely from imported bullion and includes the lead content of alloys.

<sup>5</sup>Refined nickel and nickel content of ferronickel.

<sup>6</sup>Includes witherite.

<sup>7</sup>Salable product.

<sup>8</sup>Sales, dry weight.

<sup>9</sup>Proportions of grades not available; probably about two-thirds acid grade.

<sup>10</sup>Sales.

<sup>11</sup>Methane, excluding gas flared or reinjected.

<sup>12</sup>Marketable methane, excluding that used for drilling, production, and pumping operations.

<sup>13</sup>Includes butane, condensates, ethane, and propane.

<sup>14</sup>Excludes condensates and gases.

TABLE 2  
UNITED KINGDOM: STRUCTURE OF THE MINERAL INDUSTRY IN 2002

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina	Alcan Inc.	Burntisland, Scotland (closed)	100,000
Aluminum:			
Primary	British Alcan Aluminium Ltd.	Fort William, Kinlochleven, and Lynemouth	175
Do.	Anglesy Aluminium Ltd. (Rio Tinto Corp., 51%; Kaiser Aluminum and Chemical Corp., 49%)	Holyhead, Wales	113
Secondary	Bernhard Metals plc.	Derby	50
Do.	Deeside Aluminium Ltd.	Clwyd, Wales	45
Ball clay	Watts, Blake, Bearne & Co. plc	Various operations in northern and southern Devon	500
Barite	Laporte Industries plc.	Mines in Derbyshire	25
Celestite	Bristol Minerals Co. Ltd.	Yate, Avon	30
Cement	Aberthaw and Bristol Channel Portland Cement Co. Ltd.	East Aberthaw and Rhooose, Glamorgan, Scotland	1,000
Do.	Blue Circle Industries plc.	Plants at Aberthaw, Cauldon, Dunbar, Hope, Masons, Northfleet, Plymstock, and Weardale	7,300
Do.	Castle Cement Ltd. (Scancem, 100%)	Plants at Ketton, Ribblesdale, Pades, and Pitstone	3,400
Do.	Rugby Group	Plants at Barrington, Chinnor, Rochester, Rugby, and South Ferriby	2,700
China clay (kaolin)	Imerys Group.	Mines and plants in Cornwall and Devon	3,000
Coal	UK Coal plc	19 mines in various locations	30 <sup>1</sup>
Copper	IMI Refiners Ltd.	Refinery at Walsall, west Midlands	80
Ferroalloys	Corus Group	Teesside, Cleveland	80
Do.	Murex Ltd.	Rainham, Essex	25
Do.	London and Scandinavian Metallurgical Co. Ltd.	Rotherham, South Yorkshire	30
Do.	Eastlink Ferroalloys Ltd.	Glossop	1
Fluorspar	Durham Industrial Minerals Ltd.	Mines in Weardale	50
Do.	Laporte Industries plc.	Mill at Stoney Middleton, mines in Derbyshire	70
Gypsum	British Gypsum Ltd.	Mines in Cumbria, Nottinghamshire, and Sussex	3,500
Lead:			
Refined	Britania Refined Metals Ltd.	Northfleet, Kent	165
Secondary	H.J. Enthoven and Son Ltd. [Billiton (U.K.) Ltd., 100%]	Darley Dale, Derbyshire	60
Smelter	MIM Holdings (U.K) Ltd.	Avonmouth, Avon	55
Natural gas	Amoco Ltd. British Petroleum Ltd. Esso (U.K.) Ltd., Phillips Petroleum Co. Plc., Shell (U.K.) Ltd.	North Sea gasfields	1,250 <sup>2</sup>
Nickel, refined	INCO Europe Ltd. (INCO Ltd., Canada)	Clydach, Wales	30
Nitrogen, N content of ammonia	Terra Nitrogen Ltd.	Billingham	550
Petroleum:			
Crude	Amoco Ltd., British Petroleum Ltd., Chevron Ltd., Esso (U.K.) Ltd., Occidental Petroleum Co. Ltd., Shell (U.K.) Ltd., Texaco Ltd., Unocal, Inc.	North Sea oilfields	2 <sup>3</sup>
Refined	British Petroleum Ltd., Conoco Ltd., Mobil Oil Co. Ltd., and others	11 refineries in various locations	2 <sup>3</sup>
Platinum-group metals	Johnson Matthey Plc.	Refineries at Enfield (London) and Royston	20
Potash	Cleveland Potash Ltd. (Israel Chemicals Ltd., 100%)	Boulby Mine, Yorkshire	1,000
Salt:			
Road	do.	do.	500
Rock	British Salt Ltd.	Middlewich	800
Do.	Irish Salt Mining and Exploration Co.	Mine at Carrick Fergus, Northern Ireland	300
Sand and gravel	TMC Pioneer Aggregates Ltd.	Chelmsford, Essex	1,000
Silica sand	Hepworth Minerals and Chemicals Ltd.	Operations in Cambridgeshire, Cheshire, Humberside, and Norfolk	6,000
Slate, natural	Alfred McAlpine Slate Ltd.	Penrhyn quarry, Bethesda, Wales	25
Steel	Corus Group	4 integrated steelworks in Gwent, Lanark, Humberside, and Cleveland	18,000
Do.	ASW Holdings plc	Integrated steelworks at Cardiff, Wales	600

See footnotes at end of table.

TABLE 2--Continued  
UNITED KINGDOM: STRUCTURE OF THE MINERAL INDUSTRY IN 2002

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Stone, crushed	ARC Ltd. (Hanson Plc., 100%)	50 quarries in various locations	50,000
Do.	do.	Glensanda quarry at Oban, Scotland	15,000
Talc	Alex Sandison and Son Ltd.	Unst, Shetland Islands	15
Do.	Shetland Talc Ltd. (Anglo European Minerals Ltd., 50%; Dalriada Mineral Ventures Ltd., 50%)	Cunningsburg, Shetland Islands	35
Tin, ore	Baseresult Ltd.	South Crofty Mine, Cornwall (closed March 1998)	1,800
Titanium, sponge	Deeside Titanium Ltd.	Plant at Deeside, Clyde	5
Zinc, smelter	MIM Holdings (U.K.) Ltd.	Avonmouth, Avon	120

<sup>1</sup>Million metric tons

<sup>2</sup>Billion cubic feet per year

<sup>3</sup>Million 42-gallon barrels per day

TABLE 3  
UNITED KINGDOM: SELECTED INDICES OF PRODUCTION

(1995 = 100)

Sector	1998	1999	2000	2001	2002
General	103.3	104.1	105.9	103.6	100.0
Mining	104.2	108.1	106.8	101.5	99.6
Manufacturing	102.8	103.1	105.2	102.6	98.6
Electricity and gas	107.5	109.4	111.4	113.8	113.0

Source: United Nations, 2003, Monthly Bulletin of Statistics, v. LVII, no. 984, June, p. 16.

TABLE 4  
UNITED KINGDOM: EXPORTS OF DIAMOND <sup>1</sup>

Grade	1999		2000		2001	
	Quantity	Value	Quantity	Value	Quantity	Value
	(thousand carats)	(thousand dollars)	(thousand carats)	(thousand dollars)	(thousand carats)	(thousand dollars)
Unsorted	2,784	242,843	8,616	626,155	4,031	447,882
Gem:						
Rough	63,338	4,517,638	61,757	5,576,720	89,543	5,894,276
Cut	1,706	619,601	795	563,486	900	644,169
Industrial	29,979	36,309	27,031	43,803	11,861	29,904
Dust	49,035	17,989	NA	22,533	88,613	21,457
Total	146,842	5,434,380	98,199	6,823,697	194,948	6,590,253

NA; data not available.

<sup>1</sup> Where necessary, values have been converted from United Kingdom pounds (£) to U.S. dollars (\$) at the rate of £1.00=US\$1.57

Source: British Geological Survey, United Kingdom Minerals Yearbook 2002, March 2003, p. 46.

TABLE 5  
UNITED KINGDOM: IMPORTS OF DIAMOND<sup>1</sup>

Grade	1999		2000		2001	
	Quantity	Value	Quantity	Value	Quantity	Value
	(thousand carats)	(thousand dollars)	(thousand carats)	(thousand dollars)	(thousand carats)	(thousand dollars)
Unsorted	4,677	239,180	5,561	340,249	587	49,708
Gem:						
Rough	151,651	5,738,628	79,692	6,531,685	81,303	6,612,276
Cut	4,810	989,282	6,423	1,086,032	4,396	975,125
Industrial	8,406	17,994	16,209	28,029	7,345	19,364
Dust	64,954	20,007	98,133	23,804	74,756	22,398
Total	234,498	7,035,091	206,018	8,009,799	168,387	7,678,871

<sup>1</sup> Where necessary, values have been converted from United Kingdom pounds (£) to U.S. dollars (\$) at the rate of £1.00=US\$1.57

Source: British Geological Survey, United Kingdom Minerals Yearbook 2002, March 2003, p. 46.